

30V N-Channel MOSFETS

TO-252 Pin Configuration

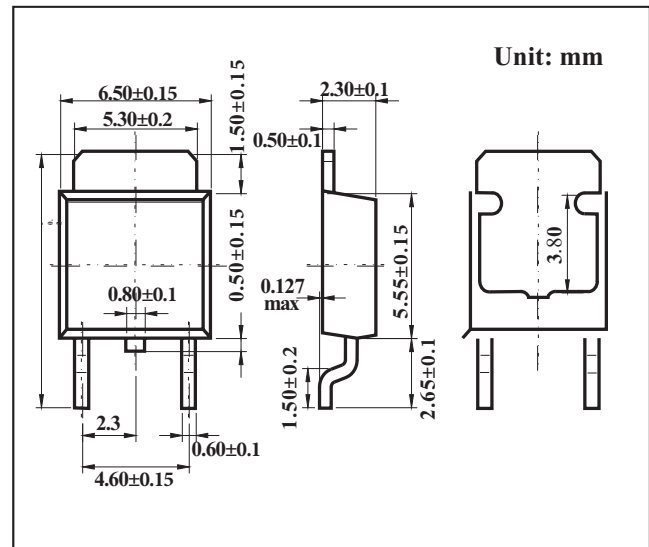
BVDSS	R _{DS(ON)}	I _D
30V	6mΩ	80A

FEATURES

- 30V, 80A, R_{DS(ON)} = 6mΩ @ V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

APPLICATIONS

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR



MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current – Continuous (T _C =25°C)	I _D	80	A
Drain Current – Continuous (T _C =100°C)		51	A
Drain Current – Pulsed ¹	I _{DM}	320	A
Single Pulse Avalanche Energy ²	EAS	88	mJ
Single Pulse Avalanche Current ²	I _{AS}	42	A
Power Dissipation (T _C =25°C)	P _D	54	W
Power Dissipation – Derate above 25°C		0.43	W/°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Operating Junction Temperature Range	T _J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction to ambient	R _{θJA}	---	62	°C/W
Thermal Resistance Junction to Case	R _{θJC}	---	2.3	°C/W



MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^{\circ}\text{C}$ unless otherwise specified

Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}, I_D=1\text{mA}$	---	0.04	---	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	---	4.8	6	$m\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	6.5	9	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-4	---	$mV/^{\circ}\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=10A$	---	18	---	S

Dynamic Characteristics

Total Gate Charge ^{3,4}	Q_g	$V_{DS}=15V, V_{GS}=4.5V, I_D=20A$	---	11.1	---	nC
Gate-Source Charge ^{3,4}	Q_{gs}		---	1.85	---	
Gate-Drain Charge ^{3,4}	Q_{gd}		---	6.8	---	
Turn-On Delay Time ^{3,4}	$T_{d(on)}$	$V_{DD}=15V, V_{GS}=10V, R_G=3.3\Omega, I_D=15A$	---	7.5	---	ns
Rise Time ^{3,4}	T_r		---	14.5	---	
Turn-Off Delay Time ^{3,4}	$T_{d(off)}$		---	35.2	---	
Fall Time ^{3,4}	T_f		---	9.6	---	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	---	1160	---	pF
Output Capacitance	C_{oss}		---	200	---	
Reverse Transfer Capacitance	C_{rss}		---	180	---	
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2.5	---	Ω

Guaranteed Avalanche Energy

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Single Pulse Avalanche Energy	EAS	$V_{DD}=25V, L=0.1\text{mH}, I_{AS}=20A$	20	---	---	mJ

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	80	A
Pulsed Source Current ³	I_{SM}		---	---	320	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=1A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	---	---	ns
Reverse Recovery Charge	Q_{rr}		---	---	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=42A, R_G=25\Omega, \text{Starting } T_J=25^{\circ}\text{C}$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

RATINGS AND CHARACTERISTIC CURVES

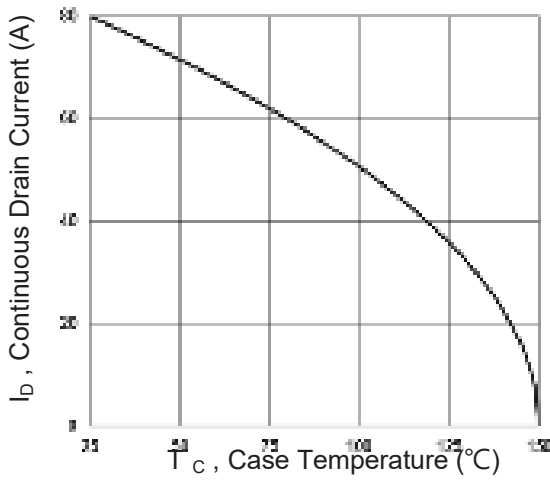


Fig.1 Continuous Drain Current vs. T_c

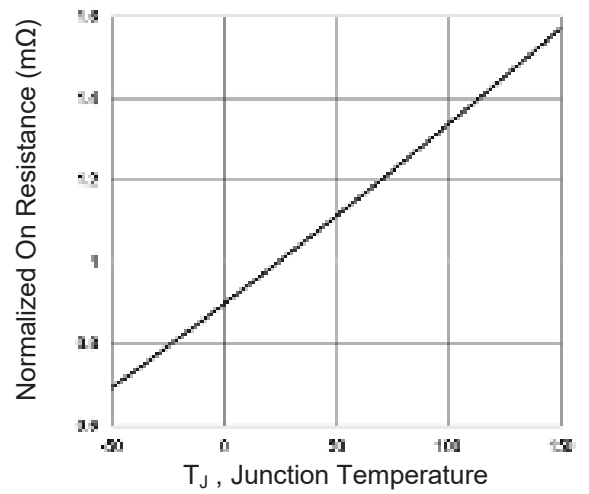


Fig.2 Normalized RDSON vs. T_j

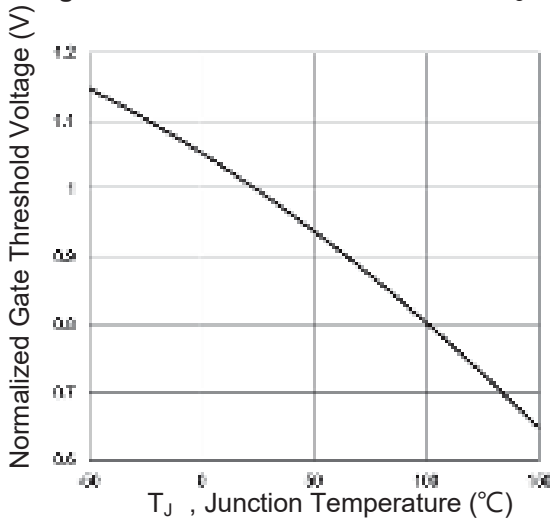


Fig.3 Normalized V_{th} vs. T_j

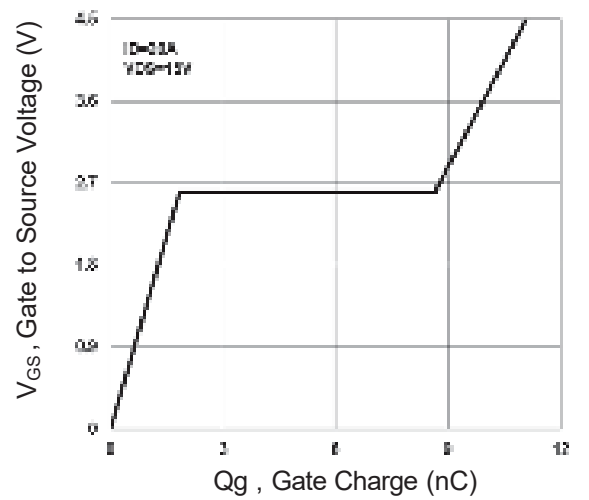


Fig.4 Gate Charge Waveform

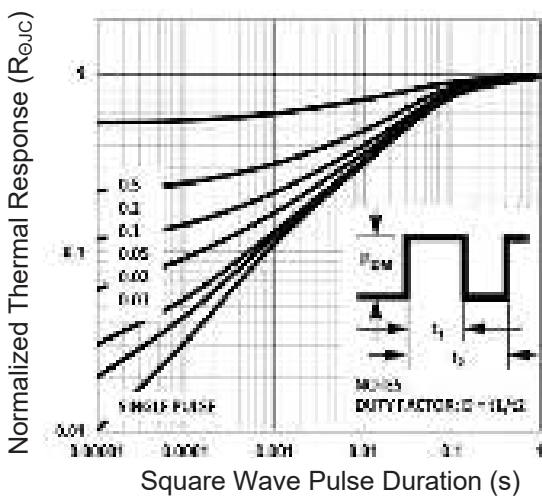


Fig.5 Normalized Transient Impedance

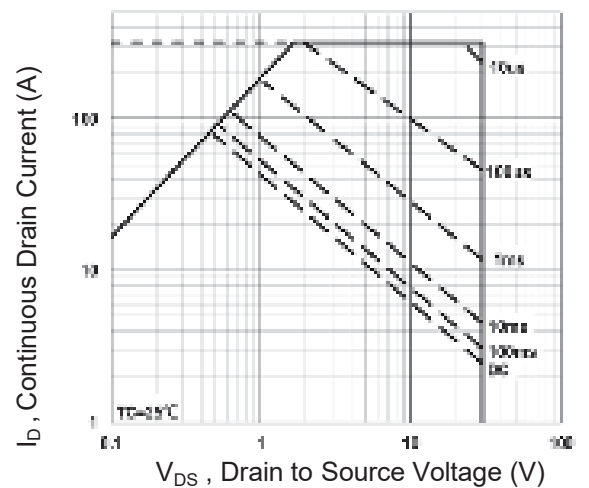


Fig.6 Maximum Safe Operation Area

RATINGS AND CHARACTERISTIC CURVES

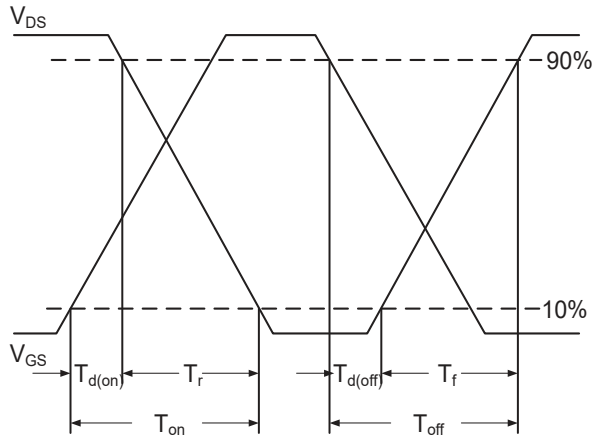


Fig.7 Switching Time Waveform

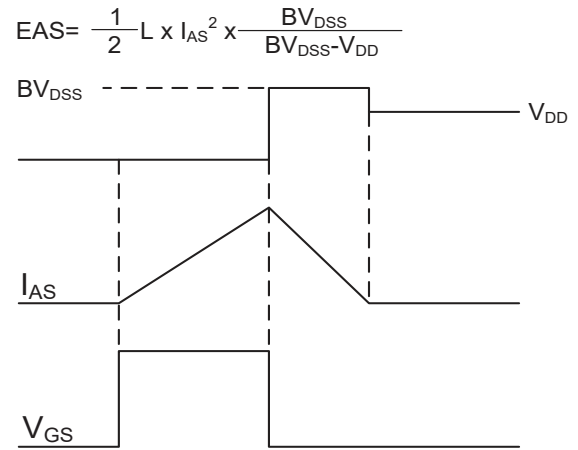


Fig.8 EAS Waveform